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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,350	08/29/2003	John P. Barnak	42390P15042	1298

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EXAMINER	
NGUYEN, DAO H	
ART UNIT	PAPER NUMBER
2818	

DATE MAILED: 03/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/652,350	BARNAK ET AL.	
	Examiner	Art Unit	
	Dao H. Nguyen	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 November 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-6,13 and 15-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 3-6, 13, and 15-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. In response to the communications dated 11/29/2005, claims 1, 3-6, 13, and 15-19 are active in this application.

Claims 2, 7-12, 14, and 20-25 have been cancelled.

Claim Objections

2. The claim is objected to for the following reason(s): In claims 6 and 19, the word "complimentary" is believed not to be the proper word, and should be changed to –complementary--. Appropriate correction is required.

Remarks

3. Applicant's argument(s), filed 11/29/2005, have been fully considered, but they are not persuasive.

First, with regard to the reference of Chau et al. (US 6,713,358), Chau does disclose the device comprising all claimed limitations. Particularly, Chau discloses a semiconductor device, or the apparatus, (figs. 1a-d), comprising a dielectric layer 130, a silicon-nitride layer 140 superjacent to the dielectric layer 130, and a polysilicon gate layer 160 superjacent to the silicon-nitride layer 140. Furthermore, it is noted that the limitation(s) "the silicon-nitride-layer has been deposited superjacent to the dielectric

layer using physical vapor deposition (PVD)" (claim 1), or "a silicon-nitride-layer formed using a physical vapor deposition (PVD) process" (claim 13) is/are process limitation(s), and the discussed claim is drawing to a product. The process limitation(s) of how the silicon nitride layer being formed has/have no patentable weight in claim drawn to structure. Note that a "product by process" claim is directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ161; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue) and In re Marosi et al, 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above caselaw makes clear. MPEP §2113 states that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)."

Therefore, the recitation that the silicon nitride layer being formed or deposited by vapor deposition process is considered a process of making product and has been given no patentable weigtht in a product-by-process claim and is thus non-limiting.

Second, with regard to the reference of Samavedam et al. (US 6,894,353), Samavedam does teach all the claimed limitations. Examiner do/does not agree with the Applicant's argument that the tantalum silicon nitride layer (TaSiN) 114 of Samavedam is not a silicon nitride layer. 114 is a layer that contains silicon doped with nitrogen, and thus, is a silicon nitride layer (as defined by Applicant in the specification, page 3, paragraph [0011]).

For the above reasons, it is believed that the rejections should be sustained and is recited as follows.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects

for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claim(s) 1, 3, 6, 13, 15, 16, and 19 is/are rejected under 35 U. S. C. § 102 (e) as being anticipated by U.S. Patent No. 6,713,358 to Chau et al.

Regarding claim 1, Chau discloses a semiconductor device, as shown in figs. 1, comprising:

a dielectric layer 130;

a silicon-nitride layer 140 superjacent to the dielectric layer 130;

a polysilicon gate layer 160 superjacent to the silicon-nitride layer 140.

See also col. 3, lines 4-66, and further the above remarks.

Regarding claim 3, Chau discloses the device wherein the dielectric layer 130 has a dielectric constant of twenty or greater. See col. 2, lines 9-40.

Regarding claim 6, Chau discloses the semiconductor device which is a complementary metal-oxide-semiconductor device. See col. 1, lines 7-20.

Regarding claim 13, Chau discloses an apparatus comprising:

a gate structure including a silicon-nitride layer 140;

a substrate 110 coupled to the gate structure;

a drain and a source coupled to the substrate (this is inherent since the device is a MOS Field-Effect Transistor which has the described gate structure). See col. 1, lines 13-27, and col. 3, lines 4-66. See further the above remarks.

Regarding claim 15, Chau discloses the apparatus wherein the gate structure further includes a dielectric layer 130 coupled to the silicon nitride layer 140, the dielectric layer 130 having a dielectric constant greater than twenty. See col. 2, lines 9-40.

Regarding claim 16, Chau disclose the apparatus wherein the gate structure further includes a polysilicon layer 160 coupled to the silicon nitride layer 140. See figs. 1(a-d).

Regarding claim 19, Chau discloses the apparatus wherein the gate structure is part of a complementary metal-oxide-semiconductor device. See col. 1, lines 7-20.

6. Claim(s) 1, 3-6, 13, and 15-19 are rejected under 35 U. S. C. § 102 (e) as being anticipated by U.S. Patent No. 6,894,353 to Samavedam et al.

Regarding claim 1, Samavedam discloses a semiconductor device, as shown in figs. 6-7, comprising:

a dielectric layer 108;

a silicon-nitride layer 114 superjacent to the dielectric layer 108, wherein the silicon-nitride-layer 114 has been deposited superjacent to the dielectric layer using physical vapor deposition (PVD) (col. 4, lines 56-58; col. 5, lines 36-38);

a polysilicon gate layer 116 superjacent to the silicon-nitride layer 114. See col. 4, lines 5-58.

Regarding claim 13, Samavedam discloses an apparatus, as shown in figs. 6-7, comprising:

a gate structure including a silicon-nitride layer 114 formed using a physical vapor deposition (PVD) process (col. 4, lines 56-58; col. 5, lines 36-38);

a substrate 102 coupled to the gate structure;

a source/drain 130/142 coupled to the substrate. See col. 4, lines 5-58, and col. 7, line 33 to col. 8, line 24.

Furthermore, it is noted that the limitation(s) "the silicon-nitride-layer has been deposited superjacent to the dielectric layer using physical vapor deposition (PVD)" (claim 1), or "a silicon-nitride-layer formed using a physical vapor deposition (PVD) process" (claim 13) is/are process limitation(s), and the discussed claim is drawing to a product. The process limitation(s) of how the silicon nitride layer being formed has/have no patentable weight in claim drawn to structure. Note that a "product by process" claim is directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ161; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue) and In re Marosi et al, 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se

which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above caselaw makes clear. MPEP §2113 states that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)."

Therefore, the recitation that the silicon nitride layer being formed or deposited by vapor deposition process is considered a process of making product and has been given no patentable weigtht in a product-by-process claim and is thus non-limiting.

Regarding claims 3 and 15, Samavedam discloses the semiconductor device wherein the dielectric layer 108 has a dielectric constant of twenty or greater. See col. 4, lines 5-23; col. 7, lines 22-32. See also US Patent No. 6,713,358 to Chau et al., col. 2, lines 4-25.

Regarding claim 16, Samavedam discloses the apparatus wherein the gate structure further includes a polysilicon layer 116 coupled to the silicon-nitride layer 114. See figs. 6-7.

Regarding claims 4-5 and 17-18, Samavedam discloses the semiconductor device wherein the polysilicon gate layer is either an n-type or a p-type. This is inherent.

Regarding claims 6 and 19, Samavedam discloses the semiconductor device wherein the semiconductor device is a complementary metal-oxide-semiconductor device. See col. 3, line 36 to col. 5, line 38; col. 6, line 24 to col. 8, line 46.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 4, 5, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,713,358 to Chau et al.

Regarding claims, 4, 5, 17, and 18, Chau discloses the device comprising all claimed limitations, except for expressly teaching that the polysilicon gate layer being of p-type, or n-type.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made that the polysilicon gate layer of Chau can be formed by selecting or using conductivity type of either n-type or p-type without departing the spirit and/or scope of the invention of Chau. Such selection of a known material on the basis of its suitability for the intended use is just within the general skill of a worker in the art. In re Leshin, 125 USPQ.

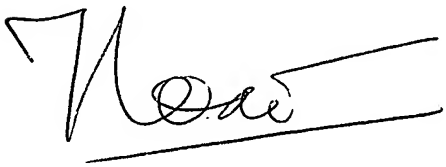
Conclusion

9. **THIS ACTION IS MADE FINAL.** A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dao Nguyen whose telephone number is (571)272-1791. The examiner can normally be reached on Monday-Friday 9:00am - 6:00pm. If

attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms, can be reached on (571)272-1787. The fax numbers for all communication(s) is (571)273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1625.



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Dao H. Nguyen
Art Unit 2818
February 23, 2006